

## U.S. Submarine Force Future Capability Vision

The President, Joint Chiefs of Staff and Combatant Commanders must have persistent, clandestine, non-provocative options and, when appropriate, overt and decisive striking power for dealing with complex threats to the security of the United States. These options are a critical component of national strategy across the spectrum of conflict from battle space preparation through deterrence and strike. Nuclear-powered submarines address these critical needs through their unique combination of stealth, endurance, agility, and firepower. Operating submerged in a closed environment, they are the only maritime platforms that are invulnerable to anti-access threats ranging from cruise and ballistic missiles to chemical, biological and radiological weapons. This makes nuclear-powered submarines the preeminent platform for assuring access to denied areas. While they are not important for all Navy and Joint missions, where they are important, they play an essential role and provide capabilities not inherent in any other platforms.

As the U.S. military transforms to meet new challenges in an uncertain world, four *Strategic Concepts* will guide the enhancement of submarine capabilities:

- *Assure Access:* Nuclear-powered submarines must maintain their unique ability to penetrate denied or sensitive areas with low risk in order to prepare the battle space and detect and/or neutralize barriers to joint force access.
- *Develop and Share Knowledge:* Nuclear-powered submarines must continue to provide timely and persistent intelligence collection that can counter an adversary's deception and denial attempts non-provocatively in any maritime area of the world. This provides national and military leaders with unique, long-term insights into an adversary's capabilities, tactics and operating patterns as well as actionable intelligence concerning real-time tactical activities.
- *Strike Rapidly, with Surprise:* Nuclear-powered submarine offensive capabilities including strike warfare, special operations forces and information operations come from "empty oceans," creating potential threats in every maritime area. Even the possibility of a U.S. submarine's presence complicates and disrupts an adversary's planning and keeps him more focused on defense. When required, rapid, precise, and decisive firepower delivered with surprise significantly enhances the tactical options available to the Combatant Commanders.
- *Dissuade and Deter:* Some states are dissuaded from investing in large offensive navies due to their vulnerability to U.S. nuclear-powered submarines. Others are deterred from using their existing naval forces to coerce neighbors or disrupt commerce since U.S. nuclear-powered submarines can hold them at risk. Moreover, survivable nuclear-powered submarines equipped with conventional and nuclear weapons serve as a deterrent to an adversary's use of WMD against the United States or our allies and friends. The nuclear-powered submarine's ability to gain access under all circumstances, obtain persistent and penetrating ground truth knowledge, and to strike with force and swiftness serve to counter WMD when deterrence fails.

In consonance with the *Strategic Concepts*, five *Technology Vectors* guide the efforts needed to deliver improved capabilities:

- *Payload:* An increase in submarine payload volume, and a wide and varied range of off-board vehicles, sensors, and weapons are all key to expanding the submarine's sphere of influence and contribution to the Sea Strike and Sea Shield elements of Sea Power 21.
- *Modularity:* Adapting new weapons or sensors to nuclear-powered submarines must be done quickly and inexpensively using a modular payload approach and with a flexible ocean interface.
- *Connectivity:* Improved connectivity between submerged nuclear-powered submarines, offboard vehicles and emerging shore and sea-based networks is required to better integrate nuclear-powered submarines into FORCEnet and thus the joint force. Improved connectivity includes reduction in time latency, increased throughput, and communication capability from below periscope depth at tactically useful speeds. Receive data rates in excess of 1 Mb/sec and transmit data rates in excess of 250 kb/sec are required in the near term.
- *Computing and Automation:* Tactical displays and decision support systems must be improved to make situational awareness more intuitive and less dependent on experience. Automation in other areas will reduce crew size and ship cost and increase payload volume.
- *Integrated Electrical Systems:* Tomorrow's nuclear-powered submarines need simplified and integrated power and propulsion systems to improve stealth, modularity and flexibility; and to support future payloads and to enhance affordability.

These strategic concepts and technology vectors will produce a much more capable Submarine Force and enable new operating concepts that provide direct and relevant contributions to the pillars of Sea Power 21. Within that context, several capabilities require development on a priority basis:

- **Sea Warrior:**
  - The technical skill, leadership, innovative spirit and warfare professionalism of our people are the most important determinants of our future and remain a central focus. To win the talent competition and prevail in combat, our culture must focus on developing warriors. Specific goals include:
    - Design ships, systems and policies around a warrior mentality. Reduce the time required for non-warfighting functions to increase the time people spend honing warfare skills, especially as a team.
    - Institutionalize a system to better identify, use and reward fleet innovation.
    - Align accession, promotion and selection policies to value characteristics and skills needed in this future Submarine Force.

- **Sea Shield:**

- Continued improvements in clandestine ASW enabled by submarine stealth are vital to battle space preparation and combat success against ever-improving enemy submarines. Among these improvements are advanced acoustic hull arrays to enable covert localization and tracking of quiet diesel submarines. Another is a submarine-deployable cueing sensor system that will allow a single nuclear-powered submarine in the hostile littoral to monitor and prosecute tactically significant areas. These efforts will build on the Acoustic Rapid COTS Insertion/Advanced Processing Build improvements already achieved for existing passive sonars.
- Revolutionary new submarine capabilities are required to localize and neutralize mines in order to enable safe passage of a submarine platform through an enemy minefield within a period of a few days. This capability will require novel sensors and CONOPs and will employ offboard payloads and sensors such as UUVs.

- **Sea Strike:**

- Persistent clandestine surveillance and targeting (including intrusive sensor placement and Information Operations) is required utilizing a network of SOF personnel, vehicles and sensors delivered and coordinated from nuclear-powered submarines. Capabilities to rapidly deploy and persistently monitor sensor fields over areas of greater than 100 sq nmi and at least 100 nmi inland are needed to provide critical information to joint forces, particularly during battle space preparation.
- Affordable payload capsules are required to enable the practical submarinization of a wide variety of weapons and vehicles not specifically originally designed for submarine deployment.

- **Sea Base:**

- Increased payload capacity with flexible ocean interfaces is required for all future U.S. submarines to better enable clandestine delivery of effects from sea, when and where needed. The goal is to achieve up to 10 times the current SSN payload in an affordable submarine design. Fundamental changes in construction methods and designs that improve platform affordability will be needed to meet these goals.

- **FORCEnet:**

- Submarines must be an integral part of Navy and Joint information networks, to include sensor networks deployed from the submarine and offboard vehicles. These networks will allow submarines to share situational awareness, to plan collaboratively and to fight synergistically with other joint forces.

- **Sea Enterprise:**
  - The Submarine Force culture is to accomplish its missions at reduced costs, with the following specific goals:
    - Improve tooth-to-tail manpower ratio
    - Sustain readiness at lower support cost
    - Reduce platform acquisition costs
    - Develop more efficient employment approaches to provide purposefully deployed, surge-capable undersea combat capability
- **Sea Trial:**
  - The Submarine Force is an integral part of the Navy's Sea Trial process with the following specific goals:
    - Apply an open but disciplined approach to innovation and concept development including active participation in wargames with other services and in joint venues.
    - Ensure purposeful data collection and analysis of field experiments, focused to support decision-making
    - Sponsor events including at least one significant field experiment and one wargame or seminar per year

By 2020, evolved submarines, manned and unmanned, networked with distributed sensors on land and at sea, will be more integral components of joint forces. Together they will have significantly greater spheres of influence and intrusive capability that Assure Access, Develop and Share Knowledge, Strike Rapidly with Surprise, and Dissuade and Deter potential adversaries.